

REMARKS

The following claims are pending in the application: 1 – 17

The following claims have been amended: 1 – 17

The following claims have been deleted: Not applicable

The following claims have been added: 18 – 22

As a result of the foregoing Amendment, the following claims remain pending in the application: 1 – 22.

The Rejection Under 35 U.S.C. §112, first paragraph

The Examiner rejects claims 1 through 17 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner notes that claims 1, 7, 12 and 16 have been amended to state that the layer is “substantially pure” zeolite. The Examiner takes the position that the term “substantially pure” is new matter as the term does not appear to have been in the originally filed disclosure.

Applicants have removed the limitation of “substantially pure” from the claims thereby rendering the Examiner’s outstanding rejection moot and respectfully submit that the Examiner’s outstanding rejection may be properly withdrawn in light thereof.

The Rejection Under 35 U.S.C. §112, second paragraph

The Examiner rejects claims 1 through 17 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Specifically, the Examiner

takes the position that claims 1, 7, 12, and 16 are indefinite for the term “substantially pure”.

Applicants have removed the limitation of “substantially pure” from the claims thereby rendering the Examiner’s outstanding rejection moot and respectfully submit that the Examiner’s outstanding rejection may be properly withdrawn in light thereof.

The Rejection Under 35 U.S.C. §102(a), or in the alternative §103(a)

The Examiner rejects claims 1 through 17 under 35 U.S.C. §102(a) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over Szabo et al.

Applicants are attaching herewith a declaration of Prabir K. Dutta, a co-inventor of the present patent application, in anticipation of receiving a similar rejection of claims 18 – 22 based upon the Szabo article. Specifically, the declaration explains that Ahmed Soliman was named as an author of the Szabo et al. article due to his contribution in preparing the article and for testing the inventive sensor, under the direction of the inventors, rather than a contribution as a co-inventor. In support of this argument, the Examiner’s attention is respectfully directed to MPEP 715.01(c) and 2132.01. Accordingly, Applicants respectfully submit that the Examiner’s outstanding rejection may be properly withdrawn.

The Rejections Under 35 U.S.C. §102(e), or in the alternative §103(a)

The Examiner rejects claims 12 and 14 – 17 under 35 U.S.C. §102(e) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Clyde et al. (US Pat. No. 6,468,407).

Applicants respectfully submit that Clyde et al. fails to either anticipate or render the present invention an obvious variation of the prior art as Clyde fails to teach each and every element of the subject invention as presently claimed. Specifically, Clyde fails to teach or suggest a NO_x potentiometric sensor which uses a zeolite coating to create asymmetry between the two electrodes in contact with a gas stream to determine the concentration of NO_x in the gas stream. Clyde is directed towards an oxygen sensor which uses two electrodes. Clyde's sensing electrode is in contact with the gas stream being monitored while the reference electrode is not in contact with this gas stream. Accordingly, as Clyde fails to teach (or suggest) a sensor which (a) determines the concentration of NO_x in a gas stream and (b) uses a zeolite to oxidize NO to NO₂ so as to create asymmetry between the two electrodes exposed to the gas stream, Clyde cannot be fairly said to either anticipate the present invention or render the present invention an obvious variation of the prior art. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

The Examiner rejects claims 1, 2, 4, 5, 7 – 10, 12 – 15, and 17 under 35 U.S.C. §102(e) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Yokota et al. (US Pat. No. 6,254,749).

Applicants respectfully submit that Yokota et al. fails to anticipate the present invention or render the present invention an obvious variation of the prior art as Yokota fails to teach each and every element of the present invention. Yokota is directed towards a CO sensor that is insensitive to NO_x. Yokota fails to teach or even suggest a zeolite which oxidizes NO in the gas stream to NO₂ so as to create asymmetry between

the two electrodes so as to detect NO_x concentration. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

The Rejections Under 35 U.S.C. §103(a)

The Examiner rejects claim 3 under 35 U.S.C. §103(a) as being unpatentable over Yokota in view of Bannister et al. (US Pat. No. 4,193,857) taking the position that it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Bannister for the sensor of Yokota because alumina is a conventional material utilized in conjunction with electrolyte sensors because it is cheap, stable at high temperature, and has a coefficient of expansion similar to zirconia.

Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn as the combination of references cited fail to teach each and every element of the invention as presently claimed. The Yokota reference has been discussed at length above and Applicants respectfully submit that Bannister et al. fails to overcome the deficiencies of Yokota to render the present invention an obvious variation of the prior art. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

The Examiner rejects claims 6, 11, and 16 under 35 U.S.C. §103(a) as being unpatentable over Yokota in view of Clyde taking the position that it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Clyde for the sensor of Yokota because the use of a Y-type zeolite was already recognized by the prior art and the substitution of one known for m of zeolite for another requires only routine skill.

Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn as the combination of references cited fail to teach each and every element of the invention as presently claimed. Both the Yokota reference and the Clyde reference have been discussed at length above and Applicants respectfully submit that Clyde et al. fails to overcome the deficiencies of Yokota to render the present invention an obvious variation of the prior art. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

The Examiner rejects claim 13 under 35 U.S.C. §103(a) as being unpatentable over Clyde in view of Gao (US Pat. No. 6,551,497) taking the position that it would have been obvious for Clyde to adopt a potentiometer, which is a conventional potential measuring means, in its measuring circuit in view of Gao, since it is clearly desirable to know and control at all times the potential between the electrodes.

Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn as the combination of references fails to teach each and every element of the invention as presently claimed. The Clyde reference has been discussed at length above and Applicants respectfully submit that the Gao reference fails to overcome the deficiencies of the Clyde reference to render the present invention an obvious variation of the prior art. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

The Examiner rejects claims 7 and 9 – 11 under 35 U.S.C. §103(a) as being unpatentable over Clyde in view of Kurosawa et al. (US Pat. No. 5,897,759) taking the position that it would have been obvious for Clyde to adopt the tubular form for its electrolyte in view of Kurosawa.

Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn as the combination of references fails to teach each and every element of the invention as presently claimed. The Clyde reference has been discussed at length above and Applicants respectfully submit that the Kurosawa reference fails to overcome the deficiencies of the Clyde reference to render the present invention an obvious variation of the prior art. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

The Examiner rejects claim 8 under 35 U.S.C. §103(a) as being unpatentable over Clyde in view of Kurosawa and Gao.

Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn as the combination of references fails to teach each and every element of the invention as presently claimed. The Clyde reference has been discussed at length above and Applicants respectfully submit that neither the Kurosawa reference nor the Gao reference overcome the deficiencies of the Clyde reference to render the present invention an obvious variation of the prior art. Accordingly, Applicants respectfully submit that the Examiner's outstanding rejection may be properly withdrawn.

New Claims 18 Through 22

Applicants have added claims 18 through 22 to more accurately claim the subject matter of the present invention. The present invention comprises a mixed potential NO_x sensor comprising a zeolite coating over one of the electrodes which oxidizes NO in a gas stream into NO₂ thereby generating mixed potential signal.

CONCLUSION

In view of the foregoing amendment and accompanying remarks, the Applicants respectfully submit that the present application is properly in condition for allowance and may be passed to issuance upon payment of the appropriate fees.


Telephone inquiry to the undersigned in order to clarify or otherwise expedite prosecution of the subject application is respectfully encouraged.

Respectfully submitted,

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